

## SEQUENCE LISTING

<110> HABERMANN, PAUL  
BENDER, RUDOLF

<120> SIGNAL SEQUENCES FOR PREPARING LEU-HIRUDIN BY SECRETION  
BY E. COLI INTO THE CULTURE MEDIUM

<130> 02481.1693

<140>  
<141>

<160> 33

<170> PatentIn Ver. 2.1

<210> 1  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Oligonucleotide

<400> 1  
ttttttaag cttgggctgc aggtc 25

<210> 2  
<211> 54  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 2  
tggcactggc aggtttcgct accgtagcgc aagcccttac gtatactgac tgca 54

<210> 3  
<211> 57  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 3  
tttttgaat tcatgaaaaa gacagctatc gcattagcag tggcactggc aggtttc 57

<210> 4  
<211> 58  
<212> DNA  
<213> Artificial Sequence

008160 92E49960

<220>

<223> Description of Artificial Sequence: Primer

<400> 4

ggttctctta ttgccgtac ttctttcggc gttctggcac ttacgtatac tgactgca 58

<210> 5

<211> 56

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 5

ttttttgaat tcatgaaaaa caccttgggc ttggccattg gttctcttat tgccgc 56

<210> 6

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 6

gttgccgtcg cagcggggcg aatgtctgct caggcaatgg ctcttacgta tactgactgc 60  
a 61

<210> 7

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 7

ttttttgaat tcatgatgat tactctgcgc aaacttcttc tggcgggttg cgctgcagc 59

<210> 8

<211> 63

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 8

ctaccctgat gggtagcgct ggtctgatgg gtaccgctgt tgctcttacg tatactgact 60  
gca 63

<210> 9

008T60" 92E4960

<211> 60  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 9  
 ttttttgaat tcatgaaaaa aatgaacctg gctgtttgca tcgctaccct gatgggtacc 60

<210> 10  
 <211> 61  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 10  
 ctgatcccggt tctttgcagc gttctgcctg ccggttttcg cgcttacgta tactgactgc 60  
 a 61

<210> 11  
 <211> 56  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 11  
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<210> 12  
 <211> 53  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 12  
 gctgcccgtg ctgttcaccc cggttaccaa agcgttacg tatactgact gca 53

<210> 13  
 <211> 57  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 13  
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008760 92E49960

<210> 14  
 <211> 53  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 14  
 gctgagctgc ctgatcacc cgggtgccca ggcgcttacg tatactgact gca 53

<210> 15  
 <211> 57  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 15  
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<210> 16  
 <211> 64  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 16  
 ctttcgctga gtatggcggt ggggatttca ctgcccgcac gggcacttac gtatactgac 60  
 tgca 64

<210> 17  
 <211> 65  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 17  
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 atggc 65

<210> 18  
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<220>

008160-9249960

<400> 18

<210> 19

<211> 60

<212> DNA

**<220>**

<400> 19

<210> 20

<211> 60

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**<220>**

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<210> 21

<211> 57

<212> DNA

**<220>**

<400> 21

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<211> 227

<212> DNA

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<220>

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<222> (1) .. (195)

<400> 22  
 ctt acg tat act gac tgc act gaa tct ggt cag aac ctg tgc ctg tgc 48  
 Leu Thr Tyr Thr Asp Cys Thr Glu Ser Gly Gln Asn Leu Cys Leu Cys  
 1 5 10 15  
 gaa gga tct aac gtt tgc ggc cag ggt aac aaa tgc atc ctt gga tcc 96  
 Glu Gly Ser Asn Val Cys Gly Gln Gly Asn Lys Cys Ile Leu Gly Ser  
 20 25 30  
 gac ggt gaa aag aac cag tgc gtt act ggc gaa ggt acc ccg aaa ccg 144  
 Asp Gly Glu Lys Asn Gln Cys Val Thr Gly Glu Gly Thr Pro Lys Pro  
 35 40 45  
 cag tct cat aac gac ggc gac ttc gaa gag atc cct gag gaa tac ctt 192  
 Gln Ser His Asn Asp Gly Asp Phe Glu Glu Ile Pro Glu Glu Tyr Leu  
 50 55 60  
 cag taatagagct cgtcgacctg cagcccaagc tt 227  
 Gln  
 65

<210> 23  
 <211> 65  
 <212> PRT  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: Hirudin-encoded  
 amino acid sequence

<400> 23  
 Leu Thr Tyr Thr Asp Cys Thr Glu Ser Gly Gln Asn Leu Cys Leu Cys  
 1 5 10 15  
 Glu Gly Ser Asn Val Cys Gly Gln Gly Asn Lys Cys Ile Leu Gly Ser  
 20 25 30  
 Asp Gly Glu Lys Asn Gln Cys Val Thr Gly Glu Gly Thr Pro Lys Pro  
 35 40 45  
 Gln Ser His Asn Asp Gly Asp Phe Glu Glu Ile Pro Glu Glu Tyr Leu  
 50 55 60  
 Gln  
 65

<210> 24  
 <211> 30  
 <212> PRT  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: Control:  
 cgtase-Ala-hirudin

006160"9234950

&lt;400&gt; 24

Met Lys Arg Asn Arg Phe Phe Asn Thr Ser Ala Ala Ile Ala Ile Ser  
 1 5 10 15

Ile Ala Leu Asn Thr Phe Phe Cys Ser Met Gln Thr Ile Ala  
 20 25 30

&lt;210&gt; 25

&lt;211&gt; 21

&lt;212&gt; PRT

<213> *Serratia marcescens*

&lt;220&gt;

&lt;223&gt; Outer membrane protein

&lt;400&gt; 25

Met Lys Lys Thr Ala Ile Ala Leu Ala Val Ala Leu Ala Gly Phe Ala  
 1 5 10 15

Thr Val Ala Gln Ala  
 20

&lt;210&gt; 26

&lt;211&gt; 22

&lt;212&gt; PRT

<213> *Pseudomonas fluorescens*

&lt;220&gt;

&lt;223&gt; oprF protein

&lt;400&gt; 26

Met Lys Asn Thr Leu Gly Leu Ala Ile Gly Ser Leu Ile Ala Ala Thr  
 1 5 10 15

Ser Phe Gly Val Leu Ala  
 20

&lt;210&gt; 27

&lt;211&gt; 25

&lt;212&gt; PRT

<213> *Escherichia coli*

&lt;220&gt;

&lt;223&gt; lamB protein

&lt;400&gt; 27

Met Met Ile Thr Leu Arg Lys Leu Pro Leu Ala Val Ala Val Ala Ala  
 1 5 10 15

Gly Val Met Ser Ala Gln Ala Met Ala  
 20 25

&lt;210&gt; 28

&lt;211&gt; 25

003150-9224960

<212> PRT  
 <213> *Shewanella putrefaciens*

<220>  
 <223> Fumarate reductase

<400> 28  
 Met Lys Lys Met Asn Leu Ala Val Cys Ile Ala Thr Leu Met Gly Thr  
     1                    5                    10                    15  
 Ala Gly Leu Met Gly Thr Ala Val Ala  
                     20                    25

<210> 29  
 <211> 23  
 <212> PRT  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: Beta -  
         Lactamase/pBR322

<400> 29  
 Met Ser Ile Gln His Phe Arg Val Ala Leu Ile Pro Phe Phe Ala Ala  
     1                    5                    10                    15  
 Phe Ser Leu Pro Val Phe Ala  
                     20

<210> 30  
 <211> 21  
 <212> PRT  
 <213> *Escherichia coli*

<220>  
 <223> Alk. phosphatase

<400> 30  
 Met Lys Gln Ser Thr Ile Ala Leu Ala Leu Leu Pro Leu Leu Phe Thr  
     1                    5                    10                    15  
 Pro Val Thr Lys Ala  
                     20

<210> 31  
 <211> 21  
 <212> PRT  
 <213> *Escherichia fergusonii*

<220>  
 <223> Alk. phosphatase

<400> 31  
 Met Lys Gln Ser Ala Ile Ala Leu Ala Leu Leu Ser Cys Leu Ile Thr  
     1                    5                    10                    15

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Pro Val Ser Gln Ala  
20

<210> 32  
<211> 27  
<212> PRT  
<213> Paenibacillus macerans

<220>  
<223> Cyclodextrin glucanotransferase

<400> 32  
Met Lys Ser Arg Tyr Lys Arg Leu Thr Ser Leu Ala Leu Ser Leu Ser  
1 5 10 15

Met Ala Leu Gly Ile Ser Leu Pro Ala Trp Ala  
20 25

<210> 33  
<211> 24  
<212> PRT  
<213> Salmonella typhimurium

<220>  
<223> Outer membrane protein

<400> 33  
Met Ser Phe His His Arg Val Phe Lys Leu Ser Ala Leu Ser Leu Ala  
1 5 10 15

Leu Phe Ser His Leu Ser Phe Ala  
20

008160" 922179960